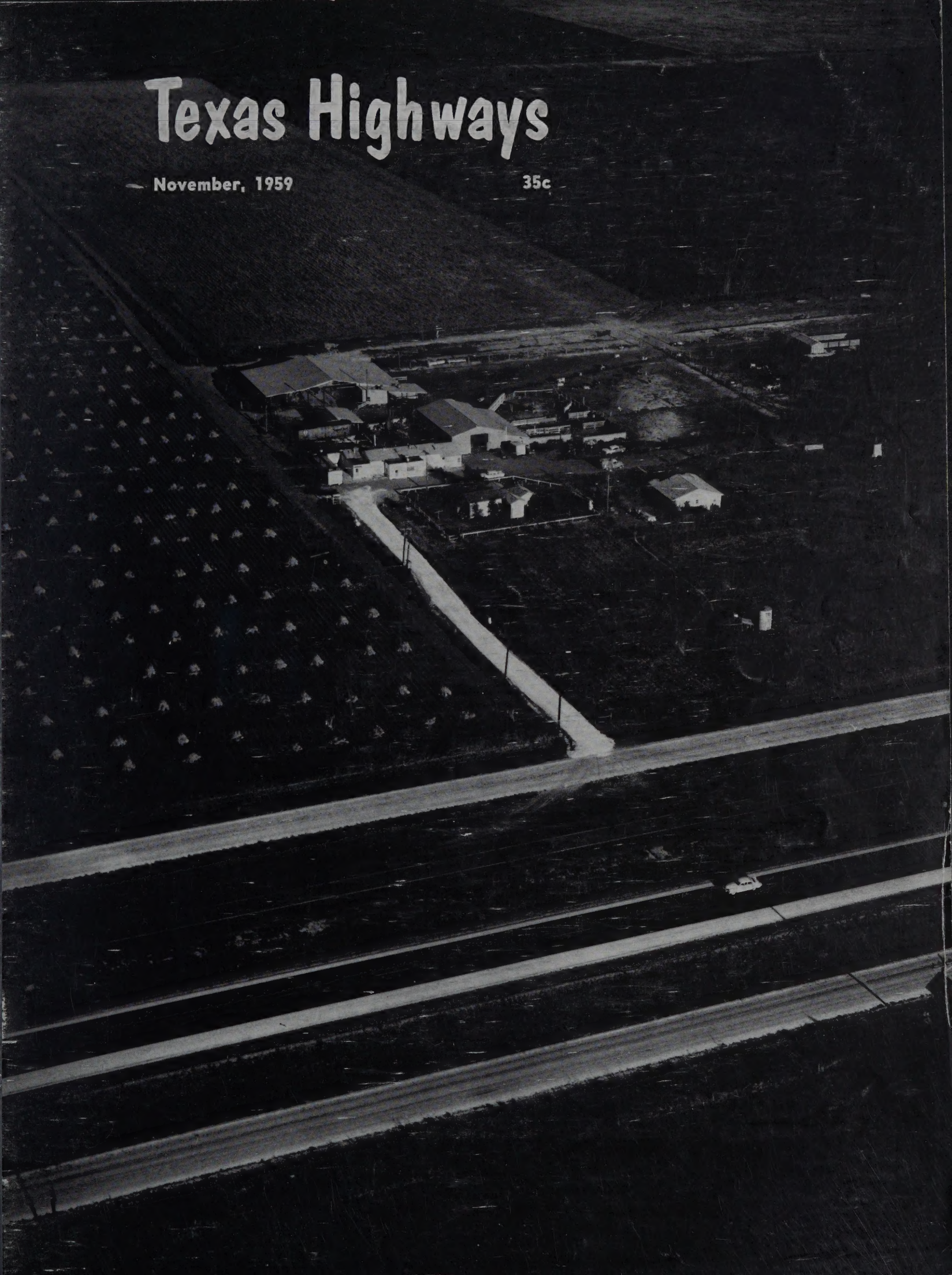
# Texas Highways

November, 1959 35c



CHEVROLET
FORD

# Texas Highways

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November, 1959

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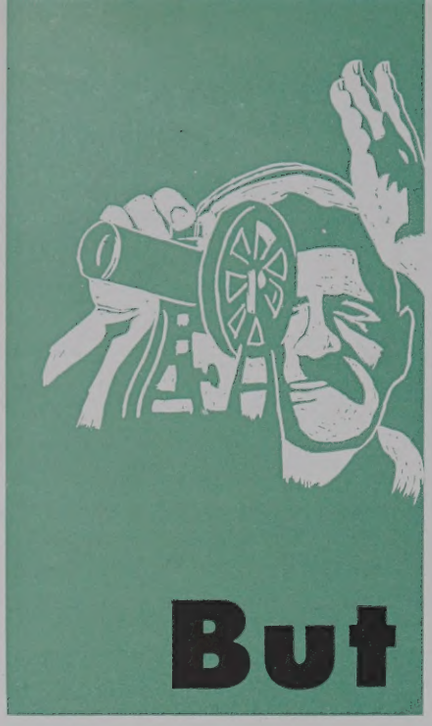


# Retired, But Hard at Work

**The last work day with the Texas Highway Department does not necessarily mean the end of a career. More and more retired personnel of the Department are traveling to foreign countries to resume work. In this article TEXAS HIGHWAYS begins a series in which these men describe engineering, sight-seeing, and adventuring in lands far removed.**

CHRISTMAS a year ago Elmer B. Calvin, Texas engineer, waved his goodbyes to friends in Dallas and once again followed where his profession was taking him. The consulting firm by whom Calvin is employed had written a contract with the Royal Thai Highway Department, so this time his destination was Thailand in Southeast Asia.

Two months later, from Washington, D. C., another Texas engineer and his wife began a journey which would take them also to that ancient monarchy. This engineer was S. C. McCarty, on a first assignment overseas with the U. S. Operations Mission, which administers the foreign-aid program for the International Cooperation Administration.

Both Calvin and McCarty now give Bangkok, Thailand, as their mailing address. In this foreign capital city about the size of San Antonio, they have encountered each other, because both are highway engineers and because—as the latest fact books state it—"a modern highway system, including links to Malaya, Burma, Laos, and Cambodia, is being built with United States assistance."

The fact that two fellow Texans of the same profession should cross paths in another hemisphere among a people of another culture is not in itself too unusual a coincidence. However, it is worthy of note that both should be retired highway engineers of the Texas Highway Department and that now through two entirely different organizations they should find themselves making Thailand a land of beginning again. The relationship of both these men to the Texas Highway Department had been far from brief or casual. When McCarty resigned in January 1958, he had been with the Department for 39 years, and he had been District Engineer in Yoakum, Atlanta, and Lubbock for 31 of those years. Calvin, District Construction Engineer in the Dallas District at the time of his retirement, was previously Senior Resident Engineer in the Austin District. His years with the Department at the time he left totaled 30-plus.

### Calvin's Work Overseas

Since his retirement in March 1956, Calvin has had assignments in four foreign countries with Charles M. Upham Associates, Inc., the firm of consulting engineers which has assigned him now to Thailand. A month after his retirement from the Department became effective, he was in Egypt. The work there on an expressway from Cairo to Alexandria, a distance of 220 kilometers, was stopped by what modern history now calls the Suez Canal Incident. Calvin was one of those whose work in Egypt was terminated when the French and English dropped bombs there. Calvin writes "our Exodus from Egypt has been the most exciting experience of any of my assignments." This brush with bombs occurred just eight months after Calvin left the Highway Department. Two months later he was assigned by his Company to duties closer to Texas. This was in Honduras, Central America, where he found himself writing all his business letters and reports in Spanish as well as English. His firm was consultant to the Honduras Highway Department, and Calvin was Project Engineer Manager.

He remained in this Central American republic nearly two years, then

***Thailand, not Texas, is the scene of this road construction. Elmer B. Calvin (at left) is pictured near the Laos Border. With him are, (left to right), Mr. Somchit, the project engineer; Mr. Krua, the division engineer; and Mike Flanakin, formerly of Louisiana State University but now with the American consultants.***

found himself on the move again. This time the job was in Southwest Asia. The country was Iran, and the work of the American consulting engineer was to assist in making an economic survey for a bond and share company. Roads, railroads, airfields, and seaports in the southeastern portion of this country once called Persia were studied, and Calvin took the opportunity to make a trip to the Caspian Sea area at the Russian border. He was back in Dallas for Christmas of 1958, two years and nine months after leaving the employ of the Highway Department, and by this time his work had already taken him to three foreign countries.

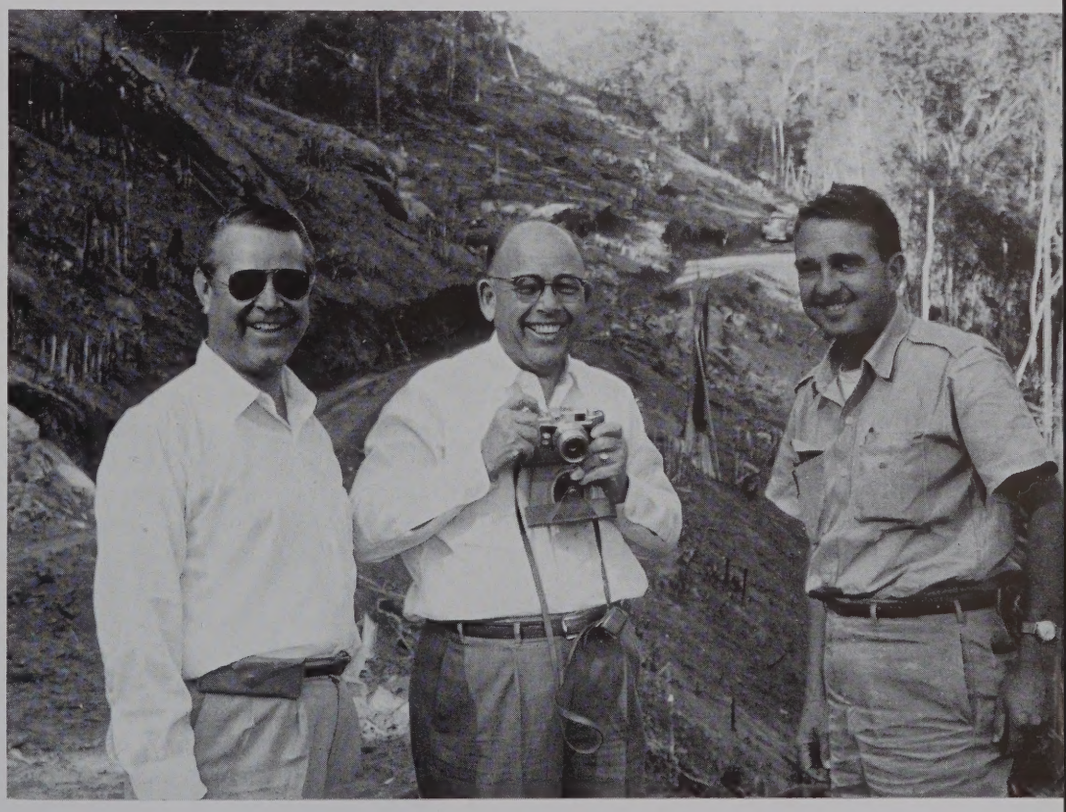
To report to his present assignment in Thailand, Calvin traveled south from Texas through Central America, down the west coast of South America, and up the east coast of that continent. He crossed the Atlantic Ocean from South America, landing in Europe. Then on his way to Bangkok he traveled through the countries of the Middle East, stopping one or two days in the principal cities.

It was during this trip that the engineer spent New Year's Eve with the former Senior Resident Engineer of District 14, Gordon Dabney, now Director of Roads in Bolivia, South America. While visiting Mr. and Mrs. Dabney at La Paz, he made a 300 kilometer trip into the mountains, and while on this excursion narrowly escaped a landslide. "Dabney's radio system and efficient maintenance crews soon had the road reopened," writes Calvin.

Referring to his present work, the American engineer explained that the contract his firm has in Thailand is a three-phase program. The Royal Thai Highway Department has hired the firm's services for aid in reorganization and for training of personnel as well as operation of an equipment pool and maintenance and procurement of equipment. He has sent a picture of himself and colleagues taken on the job at a Thailand demonstration project located near the Laos border.

### McCarty's Work in Thailand

The International Cooperation Administration is a branch of the United States Department of State. S. C. McCarty's work is with the United States Operations Mission, which administers the foreign-aid program for the I.C.A. This Mission has various divisions, such as education, health, public works and engineering, agriculture, public administration, finance, and others. McCarty has been Chief of the Highway Section in the Public Works and Engineering Division and



***S. C. McCarty, center, former District Engineer in Lubbock, Yoakum, and Atlanta Districts, makes an inspection trip to the East-West Highway in Thailand. He is accompanied by George Russell (right), project manager for the construction engineers, and Ted Moody of the International Cooperation Administration.***

***Here McCarty represents the United States at a highway meeting sponsored by the Economic Committee for Asia and the Far East. "Representatives from all the Far East were present, and it was a new and interesting experience," the former District Engineer wrote.***

in November will become Deputy to Wallace R. Vawter, Division Chief.

He writes: "We handle all types of transportation, railroads, waterways, airways, and highways, as well as electric power, waterworks, irrigation, and telecommunications. The bulk of the program is in highway construction, though water supply, radio telephone service, and electric power with its large Yanhee Dam financed by the World Bank have a fair share. We are setting upon an equipment pool containing road-building items valued at three million dollars. This we plan to rent to contractors. A four lane divided highway is planned between Bangkok and the airport."

McCarty mentioned the Highway Department in a recent letter: "The country [Thailand] maintains a highway department with well-educated engineers in charge of the various divisions. Their financial income is so limited they have to spread their funds very thin over a 12,000 kilometer highway system. Large number of Thai are being trained as equipment operators, and young engineer graduates are trained in engineering practices. The primary goal is to develop a construction industry with local contractors able to bid and handle contracts much as in the States.

A primary highway system has been designated, and where the location is good, the United States Operations Mission has been replacing worn-out timber bridges with concrete bridges. About 600 of these have been finished. Last year a highway known as the Friendship Highway, 150 kilometers long, was completed. [Read McCarty's description of the colorful ceremony when the United States Government dedicated this highway built by American engineers and contractors. TEXAS HIGHWAYS, April 1959, p. 32. Ed.] The engineering and construction were handled by American firms under the general supervision of the Mission. This was the first really good-quality road built in this country. Three other highways are in various stages of planning and construction."

McCarty, who left Washington for Thailand on February 10, 1958, described the stops he and Mrs. McCarty made on their eight-day trip. "We spent a few days in Honolulu, Tokyo, and Hong Kong and arrived here February 18. I have [since] traveled over the northern part of Thailand, and Mrs. McCarty has accompanied me on several trips. We also spent four days in Saigon, and I spent four days in Rangoon. I drove over part of the road from Rangoon to Mandalay and helped the Mission there prepare a preliminary cost estimate for rebuilding it. Early next spring we will leave here on three months home leave. We plan to travel by air and visit Indonesia, Australia, New Zealand, Fiji Islands, and Hawaii on the way to San Francisco. We plan to return by way of Europe in June."

### Roll Call of Texans

The former District Engineer mentioned other Texans he has met in Bangkok. Quoting from his letter, "The University of Texas has just completed a contract assisting Chulalongkorn University. Doctor Dunn from Abilene was our next door neighbor for a while. Others in Education include William Bloodworth from Texas A & M and, in Agriculture, John Williamson from A & M. In Highway Engineering we have E. B. Calvin and M. J. Cramer working with Charles M. Upham Associates, Inc. We see occasionally F. L. McRee from Texas Tech and Lubbock and Ted Moody from Dallas, who are associated with the Transportation Division of ICA in Washington."

(Editor's Note: Peru, Somaliland, Ceylon, Nicaragua, the Philippine Islands, and Iran are some of the other countries in which retired personnel have continued their highway careers. Word from them will be published in coming issues of TEXAS HIGHWAYS.)

# "Ole Lib" Retires

***"Ole Lib" had a variety of chores in her younger days. She went on modified service two years ago, then "Ole Lib," born in 1917, retired on September 14, 1959.***

September 14, 1959, was the last working day for "Ole Lib," as she is affectionately known by District 25 folks. We loaded her on a lowboy trailer and took her to the General Warehouse at Post, Texas, where we hope she draws light duty and the respect she deserves. "Ole Lib" is a 1917 model Liberty Truck, World War I vintage, and has been in service in District 25 since the district was formed. She was in the Wichita Falls District prior to coming to the Childress District.

"Ole Lib" has performed a wide variety of services, hauling heavy equipment, pulling graders, plowing snow. She was used twelve years as a yard crane truck before she went on modified service two years ago, being replaced by a truck of World War II vintage.

"Ole Lib" will still get around under her own power and could have made the trip from Childress to Post. However, we needed a load of centerstripe paint from Post, and it was a little easier to let "Ole Lib" ride the trailer that would otherwise have been empty.

We hesitate to show the picture with the old-style shovel because it looks so antiquated, but this picture does show one of the jobs that were routine for "Ole Lib" when she was younger. Also we might say that the shovel was quite an important machine in those days.

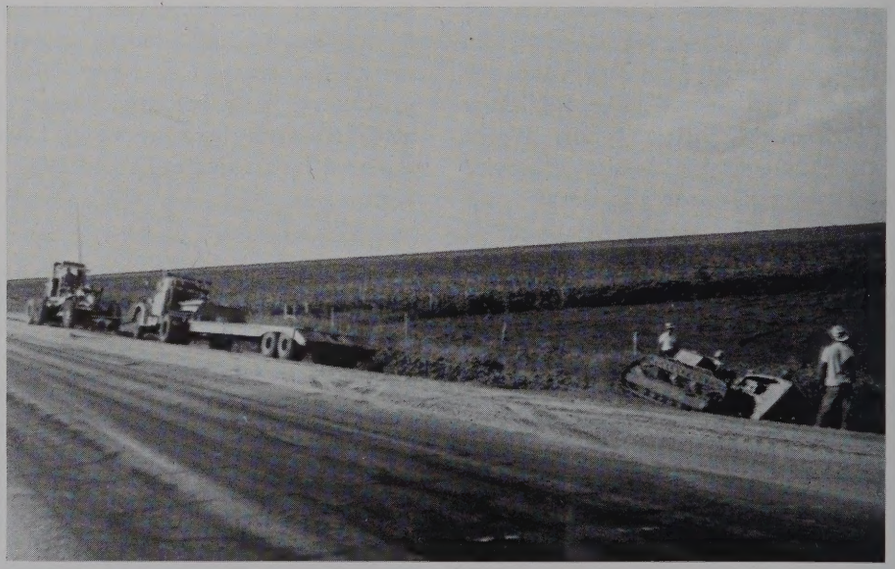
***Lib gets a ride for those last miles. She was taken to the General Warehouse at Post to be put out to pasture. Maybe she can sit back and tell the young steel upstarts of today how it was in the good old days.***

## Texas, That is

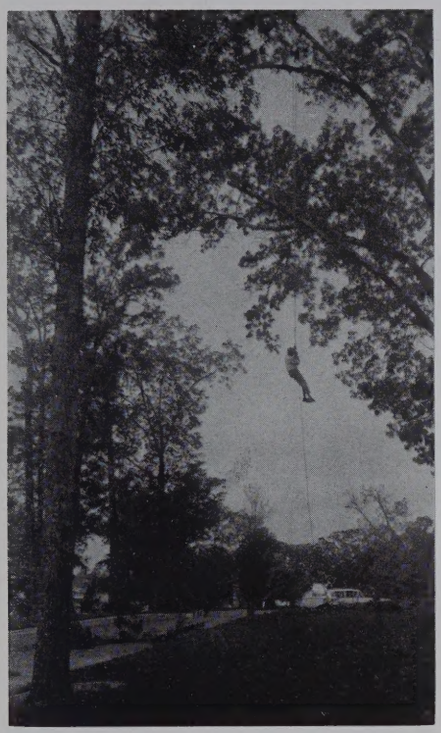
# East & West

Time and again the contrasts to be found in Big Texas are noted. These contrasts even extend into the problems facing a district engineer in—say West Texas as compared to East Texas. In West Texas, we assume that it never rains, so we think of problems of sand and dryness. District Engineer O. L. Crain, Lubbock, wants the rest of the state to know that it does rain in West Texas, and a resulting problem is related, picturewise, below.

Over in East Texas, there are problems that West Texans never even dreamed of. Pictures submitted by John Blasingame, Senior Landscape Adviser, are mostly for the enjoyment of our treeless West Texas friends. He thought they might like to see how the other half lives—where there is real daring involved in pruning a tree —in fact, where there *is* a tree.

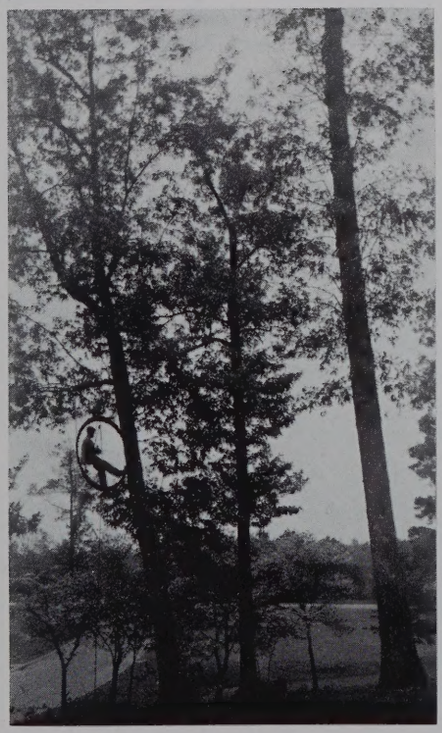


***Problem: So deep was this D-7 tractor embedded in the mud in a roadside ditch that it took the combined efforts of a winch truck and a motor grader to get it out. Deduction: It does sometimes rain in West Texas.***

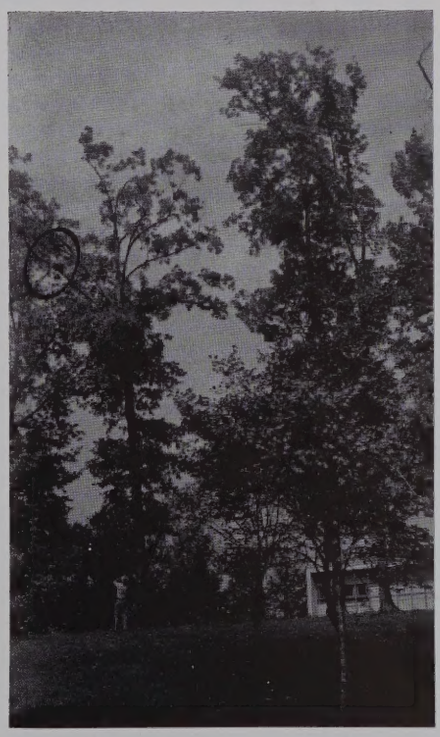


*Going up! On the District 19 grounds.*

*Some employees have state cars to get around in. These gentlemen, to get around on their job, leap from one limb to another.*

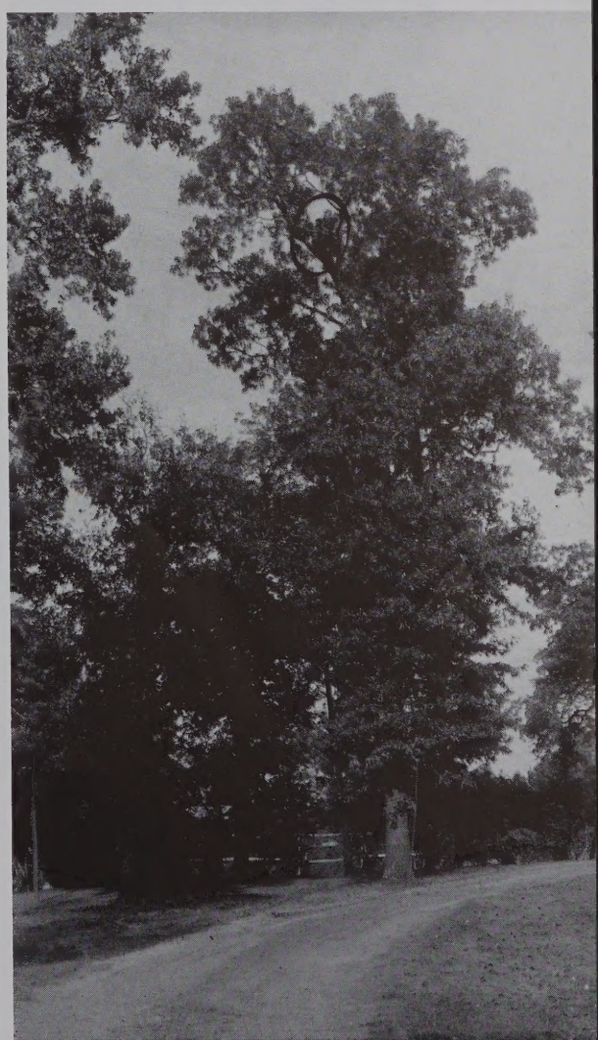


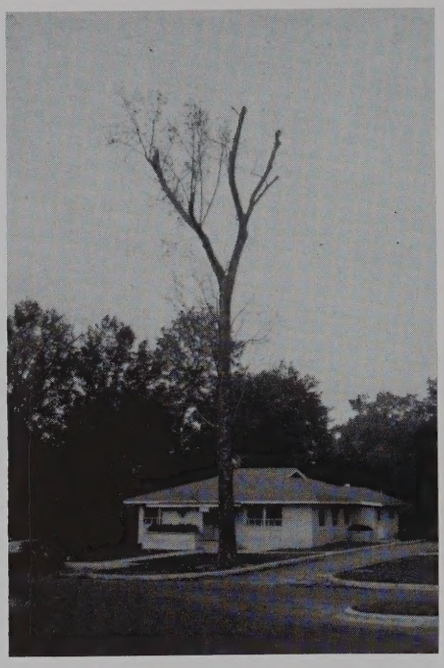
*There's nothing to it.*



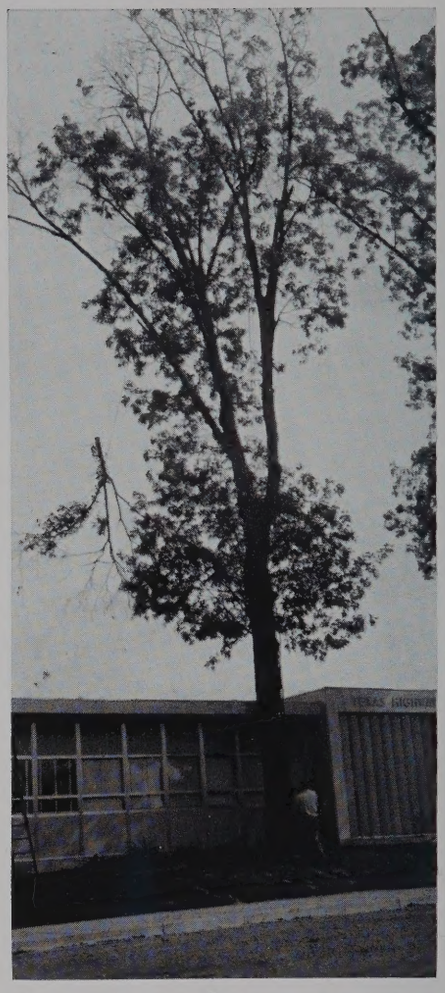
*Hard at work.*

*The daring of a trapeze artist would help on this job, except these men perform without benefit of a net.* »



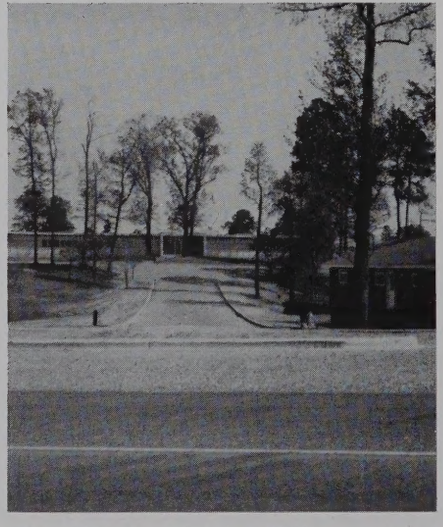


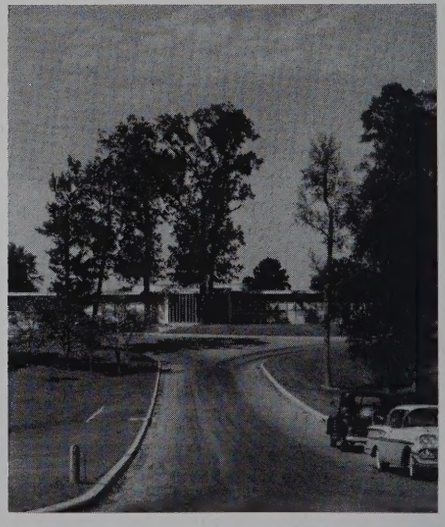
*There aren't many limbs to break a fall in this 115-foot sweet gum tree. At left, before pruning; at right, after pruning.*



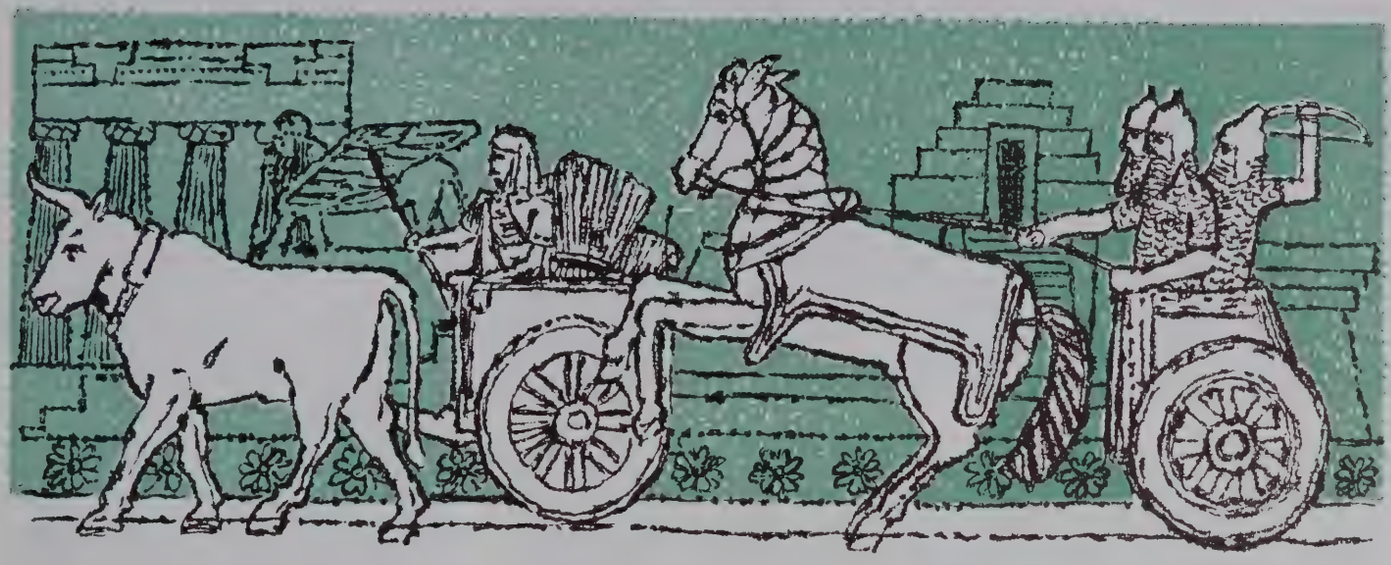
*Limbs are too large to just drop after they are trimmed, so they are lowered by rope to the ground.*

*« Size of the limbs being trimmed can be better determined in this picture. The man in the circle has just lowered this huge limb to the ground.*





*The Atlanta District Office grounds, before pruning, left, and after pruning, right.*



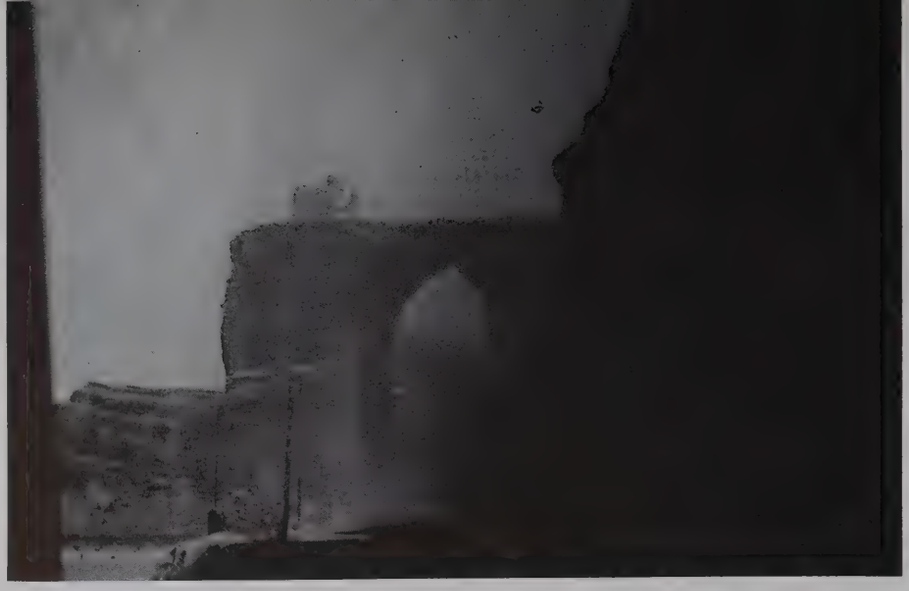
# Royal Road of Persia

When J. F. Snyder, District Engineer in Pharr, read the recent copy of TEXAS HIGHWAYS in which Tom H. Taylor reviewed the history of the Royal Road connecting the Persian Gulf with the Mediterranean Sea, recollections of the times he had spent near the starting point of the ancient road prompted him to pull some snapshots out of his picture collection. He sent these to the magazine, accompanying them with interesting comments which are shared on the following pages.

District Engineer Snyder recalls, "I was a member of the Persian Gulf Command and went to Iran (Persia) to help build highways, railways, dock facilities, and air fields for the supply route into the back door of Russia; and part of our supply route, no doubt, followed for a short way, crossed, and recrossed the Royal Road described in your article.

"I send pictures of Daniel's Tomb at Susa, which is located near the present-day towns of Shush and Dizful. The road that we were building for the supply route passed close to Daniel's Tomb and also the scattered

***This odd, pointed tower is known as the Tomb of the Prophet Daniel and is a landmark in the ancient city of Shush (or Susa) in Southwest Iran where the route of the oldest road in the world began.***



*Remains of arch bridge built by Alexander the Great, who ruled 356-323 B. C., may be seen in the Karun River which runs through what is now Western Iran.*

*Another view of the arch bridge across the Karun River.*

*These enormous stone-carved decorations once embellished Queen Esther's Palace.*

*This adobe brick castle, built by the French when they were excavating Queen Esther's Palace, was used as living quarters, for storage of valuables taken from the Palace, and for protection against the fierce mountain tribes of Iran.*

*Pit left by the French in uncovering Queen Esther's Palace. Fluted pieces of columns of the castle may be seen. Holes in sides of pit lead to burial sites.*

***Fragment of an old column from the Palace. District Engineer J. F. Snyder stands by the relic in the excavation pit.***

remains of Queen Esther's Palace. There are enclosed several pictures showing the excavation at this palace that was plundered and, for the most part, removed to France by the French. The old castle shown in one picture was built of mud brick by the French for living quarters and protection against the wild tribes in this area during the time they were making the excavation of the palace. There are many pieces of the old columns lying around, and the fancy-work around the doorways and corridors is most interesting. The Bible refers to the marble columns and corridors of the castle, but the pieces lying around at the site today are mostly traprock and limestone.

"One of the favorite pastimes of the GI's in this area was digging in the burial ground, sifting the oldtimers' ashes to secure the signature seals which were shaped like a cufflink and buried with the owners at their death.

"There are also pictures of old bridges built during Alexander the Great's time. [These structures] have for the most part collapsed, but there still remain several of the old arches, as shown in one of the pictures.

"The old Royal Road apparently swung off farther to the west than the route followed by our project, as we were headed more for Tehran and the Caspian Sea. But the starting point was not far from the same area, and I feel positive that we crossed or followed the same route in the Susa area."

● ● ●

# From District 5

**« BRACKET FOR MACHINIST'S VISE**

***This vise bracket, designed by Alvin Naylor, Machinist in District 5 shop, is used for mounting a vise on a Lyon workbench. This is a very sturdy mounting, and allows the use of the complete bench top.***

**AIR CLEANER »**

***Senior Equipment Supervisor O. R. Justiss points to a new dry-type air cleaner being tried on a grader in District 5.***

**High mileage on tires . . . low upkeep on all equipment . . . less down time and fewer major repairs—this sums up the outstanding job on equipment preventive maintenance of the Dallas District. Some of the practices which reap savings in District 18 are told here.**

Melvin Smith, who is Senior Equipment Supervisor of District 18, recalls that when Frank Cawthon became District Engineer, there was but one stipulation made by him during their first interview regarding equipment maintenance. This was that the Equipment Supervisor or a qualified assistant be at each of the section warehouses at least one morning each month to inspect all rolling stock as it moved out to the job.

"Coming as it does at irregular intervals, this inspection has paid off through the years," Smith commented recently. Foremen and operators keep equipment in tiptop repair, always anticipating a once-over, he said.

### Triple Record System

From the day a vehicle arrives new at the shop of the Dallas District until the day it is traded off, the state of its mechanical health and any remedies required to keep it running are a matter of careful record. Not one, but three separate kinds of facts are kept on each piece of equipment.

The first of these is written on a card which is placed on the board in the equipment supervisor's office where road mechanics, shop foreman, and equipment supervisor can quickly determine what parts are needed to complete a repair job. The card reveals date of the vehicle's purchase, purchase price, and the serial number. It gives such information as tire sizes, fan-belt number, and it specifies the models to designate for replacement of such parts as carburetors, generators, starters, and transmissions. On the card is space for additional information about that particular machine.

The second record for a District 18 vehicle is a work sheet kept by the shop foreman. On this is noted all shop repairs performed on an individual piece of equipment. A third view of the machine is from a cost-to-the-Department angle and is kept on record in the office of the District Accountant. Hours of use and mileage, as well as profit and loss for each month and the year's totals, are calculated. A practical record such as this not only informs at a glance how much each item of equipment is being used but also it helps in the setting up of rental rates. It proves invaluable when the time comes for trading off old equipment for new. Equipment is replaced on the basis of age, miles, and hours used, and condition as reflected on these records.

Before it begins the first assignment of its work career the equipment is registered on these three sets of records. It has been thoroughly serviced and inspected to remedy possible factory defects and faults. Should irregularities be found, these are called to the attention of factory representatives who take corrective measures before the machine rolls out to a job. Should the arrival be a heavy-duty, expensive new model, the operators are summoned to the shop where, along with the road mechanics and shop foremen, they receive instructions on lubrication and operation from a factory representative. Often such factory representatives have been asked to make a check out in the field after the equipment has been on duty a few weeks to verify that the machine is receiving proper care and to make any needed minor adjustments.

### Two Road Mechanics

District 18 keeps two road mechanics in the field continuously. In designated territories these men make repairs and correct small troubles which, if untended, would eventually accrue into serious breakdowns. The mechanic becomes familiar with the equipment under his care by working in a designated half of the district. He travels in a one-ton pickup in which he carries acetylene torches, drills, and a stock of parts to make most minor repairs.

### No Trucks Overloaded

Trucks of this district are protected against overloading by the design of the truck bed. It is built to accommodate a load of only four cubic yards. When a new truck is assigned to the field, it goes there equipped with safety devices. These include cab protectors, heavy-duty trailer hitches, safety steps, and protective painting on the tail gate. When the equipment is issued to the maintenance foreman, he receives instructions on proper lubrication, tire inflation, battery care. All maintenance sections have lubrication charts and tire-inflation data. Too, winter conditioning is started early, and every effort is made to see that equipment is properly protected.

Says District Engineer Cawthon: "We feel that preventive maintenance is a continuous operation and urge that all concerned take a sincere interest in the equipment entrusted to their care."

# Inside the Department

### Lytton Named D.E.

New District Engineer for District 15, San Antonio, is Robert O. Lytton, former District Designing Engineer for District 15.

Lytton assumed duties of Acting District Engineer upon the resignation of F. M. Davis. Davis' duties in his almost 32 years with the Department included service as District Engineer in Paris as well as San Antonio.

A graduate of the University of Texas in engineering, Lytton has been with the Department for 25 years. He was with the San Antonio Urban Expressway from its inception in 1945, serving in various capacities, including that of Expressway Engineer. In September of 1957, he took over the position of District Designing Engineer for the entire San Antonio District.

Lytton, 50, is married and has four children.

### New Division

A reorganized and renamed Information and Statistics Division made its appearance October 1 as the Travel and Information Division.

This new division is a result of Senate Bill 152, passed by the Legislature and legalizing travel promotion and advertising in Texas. Under this bill, the Highway Department was delegated responsibility for the development and dissemination of tourist information.

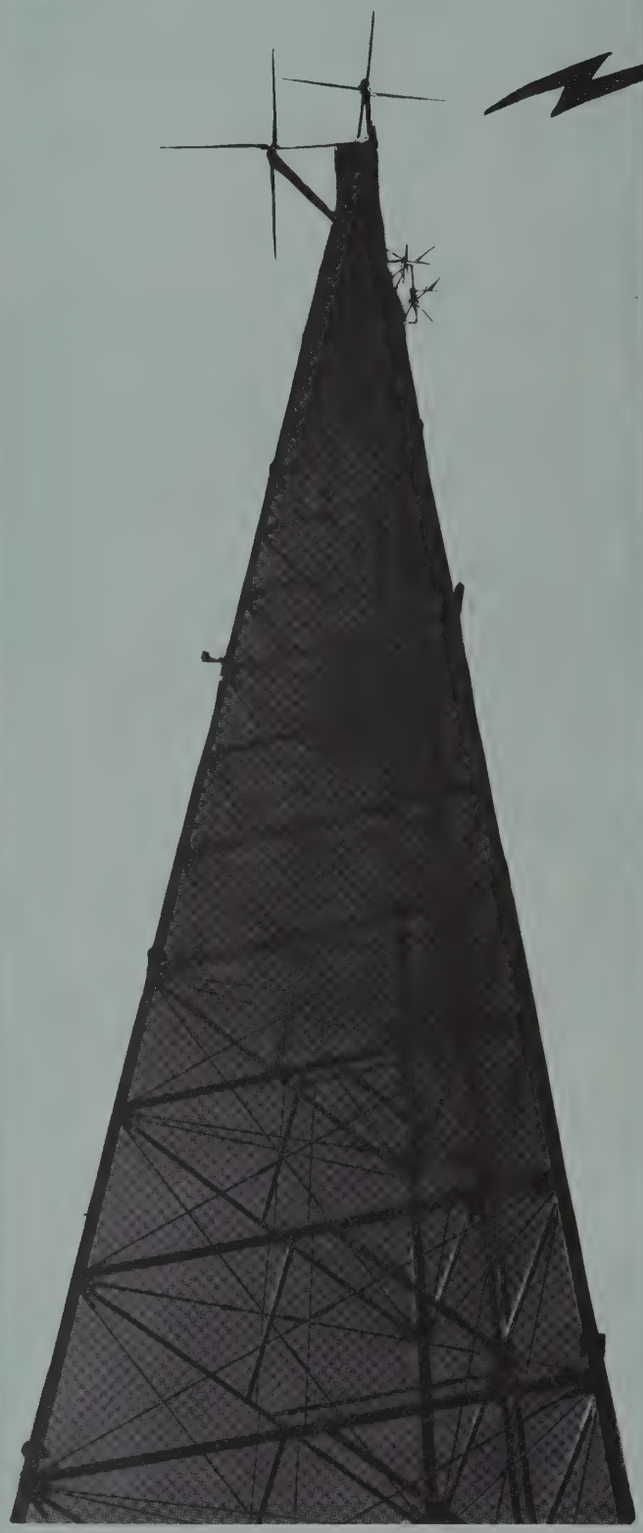
Fred T. Bennett continues to head D-16, with the title of Director of Travel and Information. Tom H. Taylor is Assistant Director of the division.

Among the duties and responsibilities of the new division are the development and dissemination of information concerning points of interest in Texas, the maintaining of tourist bureaus at entries into the state, the publishing of brochures and literature to promote travel.

The division will also provide travel counseling services for tourist inquiries by mail. D-16 will correlate and function as the Departmental public information medium, maintain a clipping service of major Texas newspapers, and prepare departmental news releases and assist highway officials in preparation of data for their use.

TEXAS HIGHWAYS, departmental magazine, and "Highway News," the Highway Travel Map, and monthly Road Condition Bulletin will be published by D-16. This division will also make studies and recommendations on U.S. and State Highway numbering; and by direction of the State Highway Engineer, will carry out other special functions relating to travel or public information.

# More on the TWO-WAY



*In Houston this 200-foot tower is one of the taller companion pieces at each of the 142 fixed base stations. Most towers are 100 feet high; a few are 150 and 200 feet. All are designed to withstand winds of 100 miles per hour.*

TWO-WAY radio in the Texas Highway Department has two sides—the highway maintenance side and the civilian help side. As a matter of fact, its potential as a communications pivot during civilian emergencies gives it such value in the eyes of the United States Department of Defense that the tab for half of the $900,000 initial cost of the state-wide installation has been assured by federal funds. The Department of Defense says, "In the event of unusual emergencies [air raids or disasters similar to that in Texas City] highway maintenance personnel and equipment must be mobile, flexible, and easily controlled." Modern standards prescribe two-way radio systems as the best way these three necessary qualities can be accomplished.

In October the last antenna tower was erected in the last Highway Department district of the state. Completion of this system brings the Texas Highway Department in communications step with 22 other state highway departments. Thirteen of these states are western, six are eastern, and three are in New England. Seven share their systems with the state police, two rent theirs, and the remaining thirteen—like Texas—are owners.*

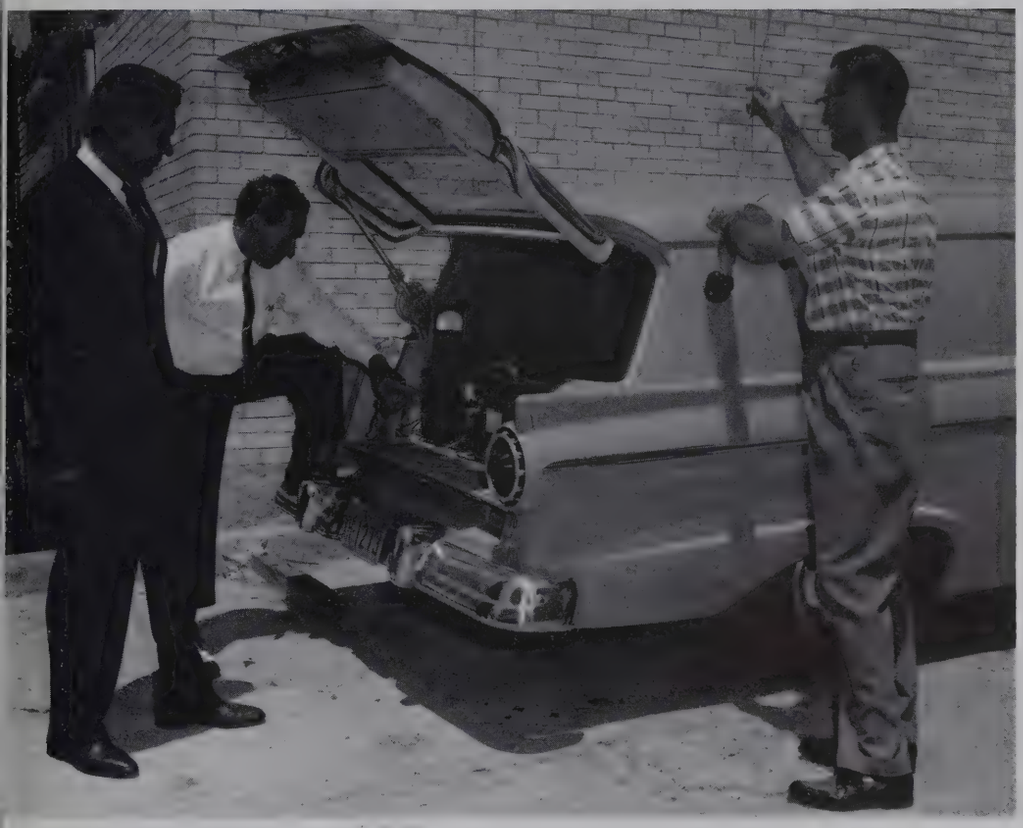
As applied to highway maintenance in Texas, the two-way radio system of communication offers optimistic prospects. In addition to its value in emergencies, it will mean that more work can be done with fewer people and machines. Such confident expectations are based on studies made in two districts. Results of these studies were considered before the modernizing communications touch was installed in the other 23 districts.

Amarillo and Houston were the districts put to the test. The West Texas district, with its snow, dust, and windstorm emergencies, was selected as an example of a district with no major population concentrations. Houston, with the largest maintenance budget in the Department, exemplified a major population concentration and a district which must cope with hurricanes, storm tides, and floods. In these differing sections of the state a consulting engineering firm made a feasibility study of two-way radio in-

*Share with state police: Arizona, Colorado, Kansas, New Hampshire, Oregon, South Dakota, Utah. Rent: Delaware, Pennsylvania. Own: California, Idaho, Maine, Massachusetts, Mississippi, Montana, Nevada, Ohio, South Carolina, Virginia, Washington, West Virginia, Wyoming.

# WAY RADIO

**Nella Dieter, Journalist**
**Travel and Information Division**



stallations. On the pages of its final report the company made the following pronouncement: "It appears that a 10 per cent over-all increase in efficiency in highway maintenance [throughout the state] could result, and this would pay out the installation cost in most districts within a year."

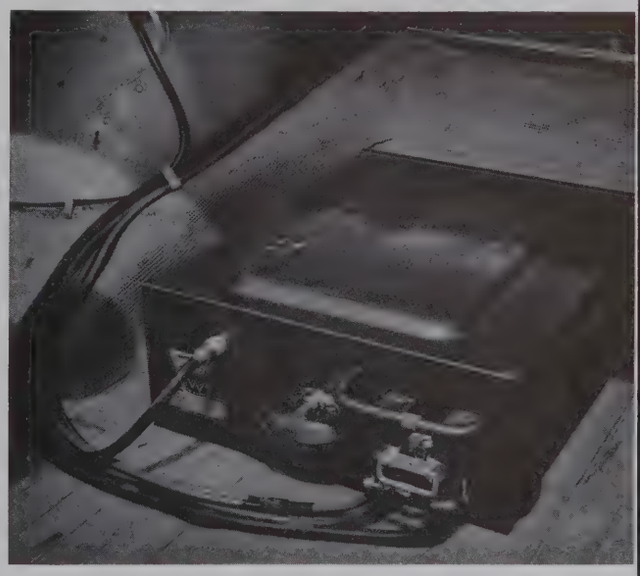
At the time of the study the Port Bolivar Ferry in District 12 had the only two-way radio unit in the Texas Highway Department. Between the ferry office and the two large ferries a radio system assisted the manager in his supervisory functions. This was used also in the interest of safety.

The consulting engineering firm wrote its feasibility study after investigation of two-way radio results in nine other state highway departments. It also canvassed industrial users and other civil agencies. Justification for adding the system to the Texas Highway Department was expressed this way in the published study: "Safety, service to the public, emergency use, and coordination with other agencies are all improved by the use of radio communication."

Figuring Houston District as an example of the increase over a five-year period both in costs and highway mileage, the study calculated re the Department's state-wide use of two-way radio: ". . . the 10 per cent increase in over-all efficiency [in District 12] will effect a $59,000 saving the first year, as compared to the estimated installed cost of $48,900. . . . A similar evaluation is shown for District 4 with slightly lower savings. Other districts will have similar

***This truck, piloted either by James Lewis (right) or Julius Donnell (center), visits all districts to check base stations and mobile units of the two-way radio system. The two Senior Communications Superintendents from Austin point out to Roger Q. Spencer, Engineer of Field Maintenance, the test equipment used.***

***This black box in the trunk or other out-of-the-way location in a car or truck is the heart of the two-way radio system. A control head, microphone, and loudspeaker are located beneath the dashboard within easy reach of the driver.*** »



***Architecture of this modern radio house conforms to that of the nearby warehouse. It is a combination radio base station and radio repair shop. Most base stations were installed in existing Departmental buildings.***

economic justification in varying amounts."

Installation of the system in Texas was gradual, Roger Q. Spencer, Engineer of Field Maintenance, explained. The system was designed in four increments by consulting engineers. Contractors handled each installation separately. The location of base stations—taking into consideration terrain, electrical noise levels, and kind of antenna to be erected—and the incorporation of these fixed stations into present facilities was handled in the engineering contract, Spencer said. "The Department furnished radio houses, concrete bases for towers, and a certain amount of the wiring. In a few isolated sections the Department built roads. It also erected timber antenna poles in a number of instances," the Engineer of Field Maintenance summarized.

The new facilities were immediately put into use by each District as soon as trucks, snow plows, and other vehicles were equipped with mobile units.

Each district became the owner of four or five base stations which are both receiving and transmitting stations. Most of these 142 fixed base stations with their accompanying antenna towers were set up in buildings already owned by the Department. Location of each base depended upon the height requirements for the antenna. If this tower could not be placed or installed near an established building, a small radio house was built at the proper location. Usually most of the new buildings were erected on Department land in the vicinity of a district warehouse; but in some instances it was necessary to install these buildings and antenna towers at isolated locations such as mountain tops in order to obtain adequate communications with other base stations as well as mobile units.

A remote-control unit, capable of either receiving or sending, has become part of the office equipment of every maintenance engineer in the state. District engineers, too, have these, as do district shops. Generally the district headquarters can talk to all base stations within the district. Sometimes in the larger districts the messages are passed like a relay torch from base to base until they are with-

***George Seelke, Equipment Supervisor in District 12, transmits a message from the truck used for servicing traffic lights. On a vehicle of this type the two-way mobile unit is fitted in a weatherproof case and mounted outside. Racks have been provided in certain emergency equipment such as snowplows so that mobile units may be rapidly transferred to them from other vehicles when needed.***

***In Amarillo at the District office, Secretary Dorothy Worden makes the daily check of the CONELRAD monitor. CONELRAD installations are located in headquarters offices of each district. Should a civilian alert be necessary, CONELRAD messages will come through this receiver which is operating at all times.***

in range of the vehicle for which they are intended. These vehicles, which make up the mobile fleet, are able to contact at least one base station at all times.

Under the new system there is car-to-car communication using 50- to 60-watt transmitters, although the range for this is only 25 to 30 miles. Car-to-base distance will extend for 35 to 50 miles. The range within which bases can communicate with other base stations depends primarily upon elevation of the antenna. Since the frequency assigned to the Department by the Federal Communications Commission has what the communications man calls "some curvature" and antennas are on towers at both ends of the line, the base-to-base range will vary from 75 to 100 miles or more. This distance will depend upon weather and other conditions.

With the exception of the Lubbock, Amarillo, Childress, and Houston districts, which operate on a one-frequency system, the entire two-way radio network is a two-frequency arrangement. The base stations may broadcast to the working field unit on a certain frequency and to other base stations on a second frequency. On a two-frequency plan such as this, interference is reduced between the two kinds of communications traffic. To illustrate: The base station in Pecos may talk to another District 6 base station in Monahans, yet the car-to-car conversation going on between a maintenance truck and the maintenance foreman's coupe in the field between the two bases can continue uninterrupted on a separate frequency assigned to mobile units.

Now that two-way radios are physically installed throughout the state,

***In Amarillo, Kenneth Blanton is Radio Maintenance Supervisor. Eight districts have added to their personnel a radio technician who holds a radio-telephone first-class or second-class license. Here Blanton tests circuit in a mobile unit transmitter.***

***Here Broom stands at the base station emergency transmitter which bears the Civil Defense symbol. Should telephone lines or connecting wires to the remote control units fail, the base station can be operated from this transmitter.***

the next considerations are maintenance and the technical adjustments which will get the bugs out. Two Senior Communications Superintendents from Maintenance Operations in the Main Office, Austin, recently discussed demands of the new communications setup. Julius Donnell and James Lewis pointed out that some of the problems with which districts are struggling are the knotty kind which will require time to untie; others will smooth out more readily.

They explained that the original state-wide two-way radio system designed for the Department was a minimum installation. By now, in practically all districts, mobile units have been added. Also, in several instances additional base stations have been installed to take care of increased operational needs. Such additions as these affect the original design, and technical rearrangement is needed periodically.

The special truck in which Donnell and Lewis travel to the districts from Austin has become a familiar sight in nearly all the districts during the installation period. The Department must comply with FCC requirements in maintaining its two-way radio equipment, Donnell commented; and this truck from Austin is outfitted with measuring devices to aid the district radio maintenance man or check the adequacy of the maintenance services which base and mobile units are receiving from contractors. The truck can send messages and receive them, and from inside it Donnell and Lewis can check mobile units while driving. Certain instruments within the cab and panels enable the supervisors to compare signals in use in the district with the known signals used by the National Bureau of Standards.

Repair and maintenance of the equipment for one year was included in the contract which the installing firm made with the Department. As these initial maintenance periods expire, some districts renew servicing arrangements with the radio service companies which have been handling the work. Others secure radio technicians and repair parts and take the matter of radio maintenance into their own hands. Donnell and Lewis report that experience up to now favors the districts performing maintenance with their own technicians. With this plan a district is better able to make additions and modifications, carry out the usual administration, and in time of emergency control its radio system more positively. In some

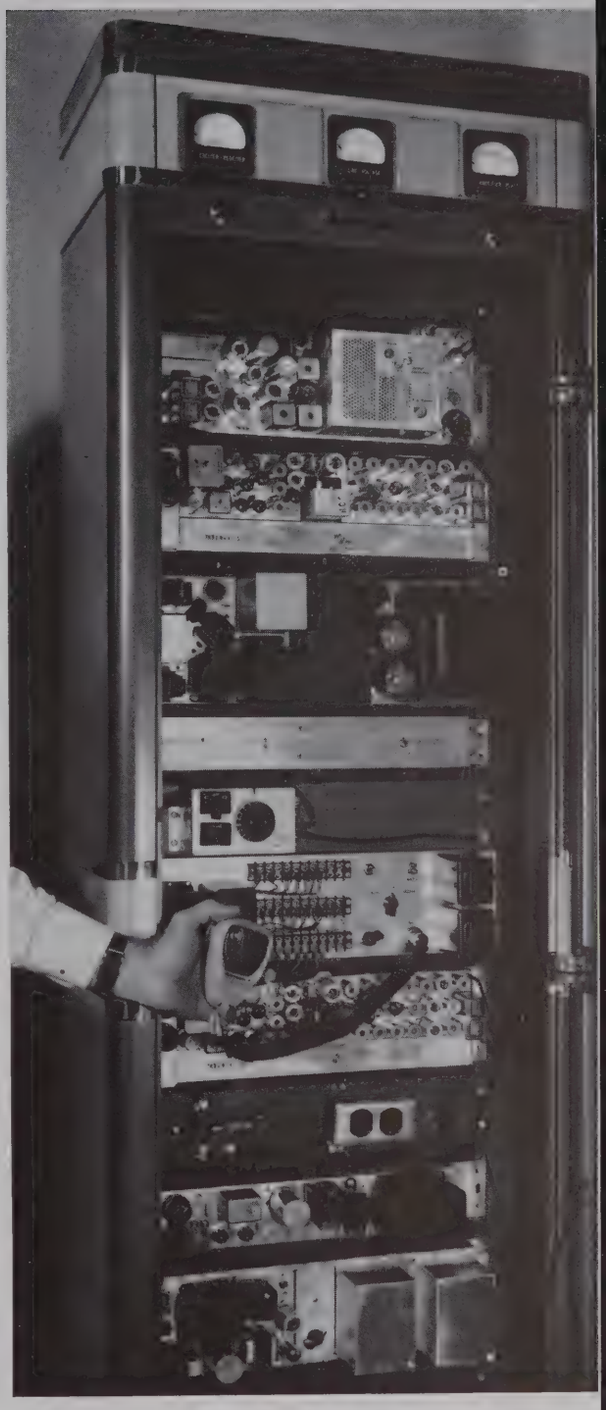
***Clyde Broom, Warehouse Patrolman in the Brownwood District, demonstrates use of the auxiliary supply to provide emergency power which may be needed for the base station if normal sources fail. This auxiliary is located in the building pictured above and is in a room adjacent to the transmitter.***

districts the radio technician handles other work in addition to this special assignment.

The manner of solving ever-present maintenance demands does not, however, require as much attention from the Austin trouble shooters in this getting-started phase as does the interdistrict complaint of radio interference. The two-way radio system of the Department was intended by its design to furnish a communications medium within the confines of the individual districts. But at peak work periods, such as the first thing in the morning when assignments are being given to work crews, there may be a jumble of undecipherable talk when voices from adjoining base stations mingle. There have been freakish happenings, as the times when bases in Houston district heard Oregon stations loud and clear. Other districts have reported similar happenings from Kansas, Arizona, and the Pacific Islands. Changing the elevation and direction of antennas is one of the remedial measures which the Austin radio communications men find necessary to prescribe at times. Six frequencies or the use of tone-actuating equipment would be required for the reduction of interference between districts in the state-wide system, Donnell and Lewis say. The Department operates only on two frequencies due to FCC regulations. This knotty interference problem, then will require constant attention, the D-18 communications superintendents forecast.

There are 56 ways of saying—in radio dispatch code—the things highway maintenance men in Texas find necessary to communicate during the daily grind and during emergencies. A code for road conditions and weather reporting has also been worked out, and the pocket-size book containing these has been issued to every district. The Department is collaborating on a uniform radio dispatch code which it can use with the three other state agencies that have working two-way systems. These are the Department of Public Safety, the Game and Fish Commission, and the Texas Forest Commission. The use of code has been urged as especially helpful when there is poor reception. As Roger Spencer put it, "Numbers are more intelligible than words." Base stations always give their call number when going off the air, in compliance with FCC regulations. More extensive use of code is expected to become the practice in the effort to wipe out present troubles with interference, Spencer said.

***This picture shows the microphone and loudspeaker Broom will use if the base station needs to rely on emergency transmission. The working parts of a base station cabinet are behind a closed panel when the machine is not in use.***



Auxiliary power units, located usually in the warehouse near a base station, are the standby should power fail. These are put in operation manually when the base is located in a warehouse. If, however, the radio house is at a more remote location, an automatic device will start the power should the base station need it.

The feasibility study mentioned some of the likely instances when two-way radio will be put to use. The practical list follows:

To give advance warning to maintenance operations of snowstorms, hurricanes, and floods, enabling personnel and equipment to be concentrated in the expected emergency area.

To notify the supervisor in charge of maintenance personnel, so he can instruct the proper persons for clearing, flagging, and repairing when tornadoes, wrecks, flash floods, windstorms, and similar happenings block the highway to traffic and damage bridges and traffic lights.

To reduce delays caused by a lack of material, the breakdown of machinery, or the need for more men and equipment.

To notify the Department of Public Safety in the event of highway accidents, so ambulances, wreckers, and other assistance may be summoned to the scene.

To transmit news of a dead animal to the nearest rendering plant at the time the animal is sighted, so the rendering company can remove the hazard and the objectionable sight rapidly and free of charge.

To transmit information concerning the condition of the highways to distribution points more rapidly, more often, and more accurately.

First
Place Award
Lloyd E. Killough
and his crew
in Bovina, Parmer county
In recognition and appreciation for the first class condition of his section in the District 5 maintenance contest for 1959.
Given this 31st day of July, 1959.
O. L. Crain
District Engineer

# Maintenance Contest, District 5

Lloyd E. Killough is winner of a recent district-wide maintenance contest, District 5. The contest was between maintenance sections, and grading was done by Bruce Bryan, Maintenance Engineer; Joel D. Willson, Senior Maintenance Superintendent; and District Engineer O. L. Crain.

A mark of one was given for any deficiency in the traveled surface of the road; a mark of three-quarters for any deficiency in the shoulders, and a mark of one-half for any other deficiency found along the roadway. Only deficiencies within the control of the maintenance foremen were graded against them.

Eugene Munselle of Lynn County won second place, and Emerson Wyer of Swisher County was in third place.

R. W. Breedlove, Skilled Laborer in the District Sign Shop, prepared the plaque.

***District Engineer O. L. Crain presents contest winner L. E. Killough with a plaque as Bruce Bryan, District Maintenance Engineer, and R. W. Tucker, Assistant District Engineer, look on.***

# Road Conditions

## AND HOW THEY ARE CHARTED

The man who reports a closed highway in the Lubbock district is setting off a chain reaction. Heart of the setup is the Austin office. Veins from the 25 districts bring their individual reports to Austin. These reports are co ordinated and combined and sent pulsing back out to the districts and other areas in the form of teletypes, radio releases, and the Road Condition Bulletin.

Once upon a time a Texas highway was closed by fire. This, to the men in this state who keep tab on travel-affecting happenings, was a phenomenon. Snow, sleet, ice, and flood, long ago charted themselves a time to be expected and reported. Such weather events have a seasonal regularity. Spill over onto a highway from an East Texas oil gusher was a wholly different reason for action, of course. But the set of responses it touched off in the Texas Highway Department to let the public know about the emergency could be compared to the usual reflex response which follows the tap of a doctor's hammer.

Whether the cause for a detour is unusual, like the oil fire, or whether for some run-of-the-mill reason like ice on the Amarillo highway in January, inconvenience is a cue to a group of men in the Department to speak certain lines which will let the public know.

Front-page newspaper items about closed highways and radio broadcasts about them result directly from emergency reports made by designated highway employees in the district concerned. The reporter notifies Travel and Information Division in the Main Office at Austin on weekdays and telephones to the Austin residence of A. D. Morgan Jr. or Robert C. McCarty should the necessity for a road block occur over the week end.

Once the news of flood, ice, snow, or fire has been relayed to either of these men in Austin, it is but one jump away from the front pages of regional and state-wide newspapers and from the special announcement a local radio announcer will broadcast.

After the first of December, through the spring rainy season, inclement weather communications can be expected in Austin from some district in the state at any time. The 25 district reporters or their alternates must meet a nine a.m. deadline with any special and emergency reports regarding roads in their area. They send these by teletype or by long-distance telephone, depending upon how much time remains before the deadline. Such news received up to the final hour is compiled into one press release by Morgan at the Travel and Information office. This word is carried by a Department messenger to the State Capitol Building across the way where Associated Press and United Press International have offices. From here the news is routed to the teletype machines of member newspapers and radio stations of the two wire services. The notice of a closed road will then appear in the noon and afternoon newspapers and will be heard on noon broadcasts. To be included in morning editions of the news and on late broadcasts, the Austin office must have items from district reporters by four p.m.

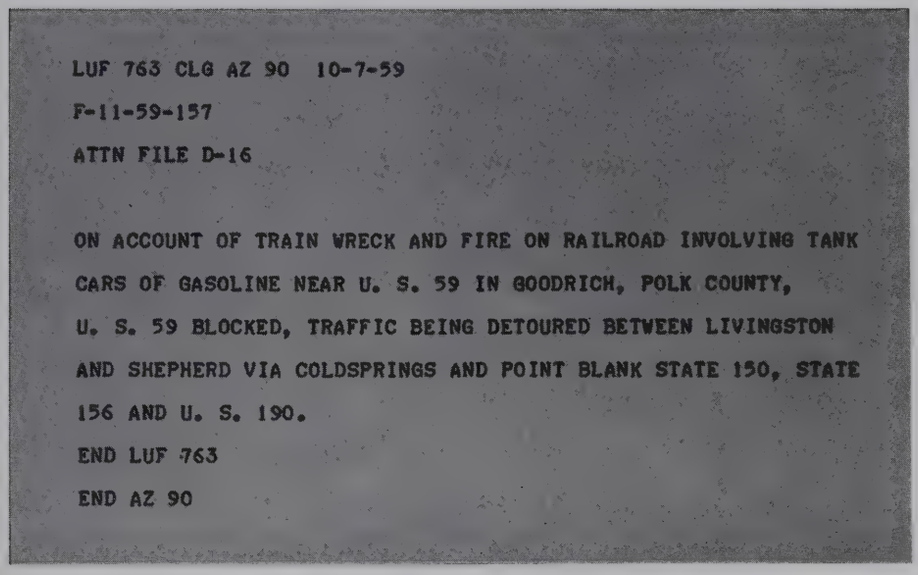
Dissemination of disrupted high-

***Weather, deep and cold, is cause for a rush of teletype messages and telephone calls to Travel and Information Division in the Main Office, Austin. The man who organizes this information, A. D. Morgan Jr., notes on a desk glass placed over the Highway Travel Map all the highways closed by a winter emergency.***

way service does not begin and end with the news agencies. Maintenance Operations Division always receives the information, and if conditions justify more widespread attention, all Divisions in the Austin office will receive word. The same reports are furnished by D-16 to the Department of Public Safety, the Division of Defense and Disaster Relief, to the Austin Weather Bureau and the Austin police—all of whom pass along the knowledge. Morgan pointed out that in these emergency announcements, perhaps as important as the news of a road shutdown is the additional information of the hour the location may be expected to reopen. To qualify as adequate the message will give this road information: Where closed, why? Is there a detour, where? And—as important as the other questions—when will it open? Morgan illustrated with a sample message which would meet the requirements: "District 15 reports U. S. 81 closed five miles south of Dilley by floodwaters. It is expected to open by ten o'clock Tuesday morning."

Regularly the district reporters check in with Travel and Information Division to supply road condition information for still another type of service the Highway Department supplies. This is on the twenty-fifth of each month when they meet the deadline for the Road Condition Bulletin. This blue-line map of all state and U. S. highways is compiled by D-16 to meet a printer's deadline. "Twenty-four hours after the information has come from the districts the map must be complete and in the hands of the printer if the new Bulletin is to be distributed on the first of the month," commented Morgan. What the job of mapping involves can readily be understood when it is real-

***Twenty-four hours after the reporters send in their monthly report from the districts, Morgan must have the Road Condition Bulletin in the hands of the printer. The Bulletin must be received by its users on the first of the month.***



LUF 763 CLG AZ 90 10-7-59

F-11-59-157

ATTN FILE D-16

ON ACCOUNT OF TRAIN WRECK AND FIRE ON RAILROAD INVOLVING TANK CARS OF GASOLINE NEAR U. S. 59 IN GOODRICH, POLK COUNTY, U. S. 59 BLOCKED, TRAFFIC BEING DETOURED BETWEEN LIVINGSTON AND SHEPHERD VIA COLDSPRINGS AND POINT BLANK STATE 150, STATE 156 AND U. S. 190.

END LUF 763

END AZ 90

# Snow Spreads Across Texas

A mantle of deep snow spread across Texas from the Upper Red River to the Rio Grande Wednesday, and the Weather Bureau forecast more rain and snow for the state Thursday.

Snow measuring 7½ inches covered El Paso, the heaviest total there since Nov. 19, 1906, when 8.4 inches fell. Two to seven-inch snows were reported throughout the remainder of West Texas.

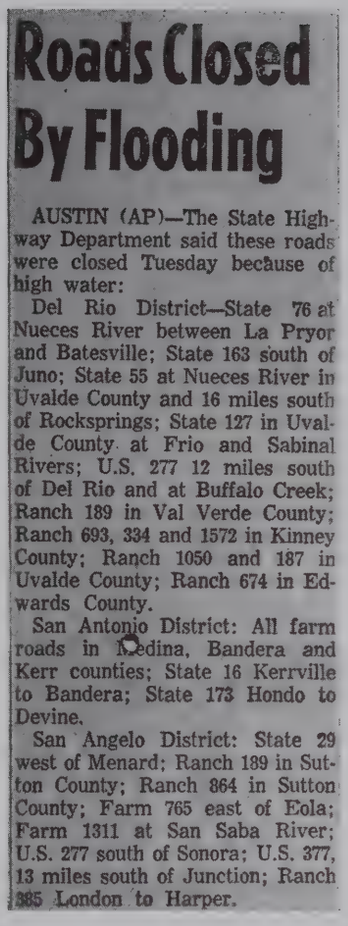
Two Texas deaths were blamed on the weather, and subfreezing temperatures expected Wednesday night prompted a State Highway Department warning to drivers in West Texas.

Drivers were asked to use roads for emergency traffic only. All highways were open, but ice was due to cover them during the night.

Most of the precipitation across the state had let up by midafternoon Wednesday, but the new onslaught, caused by a new cold trough heading eastward across Texas, was expected to begin after nightfall.

Occasional snow was predicted Thursday in the Panhandle, South Plains, Upper Pecos Valley and North Texas. Some thundershowers were due in those areas as well as in East and South Central Texas.

Blizzard conditions existed Wednesday in northern Oklahoma, grounding air traffic at Okla-



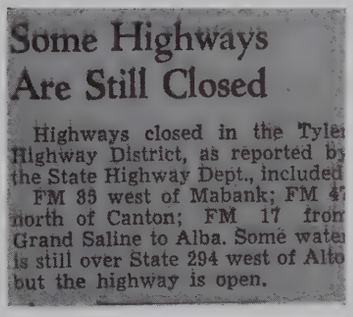
# Roads Closed By Flooding

AUSTIN (AP)—The State Highway Department said these roads were closed Tuesday because of high water:

Del Rio District—State 76 at Nueces River between La Pryor and Batesville; State 163 south of Juno; State 55 at Nueces River in Uvalde County and 16 miles south of Rocksprings; State 127 in Uvalde County at Frio and Sabinal Rivers; U.S. 277 12 miles south of Del Rio and at Buffalo Creek; Ranch 189 in Val Verde County; Ranch 693, 334 and 1572 in Kinney County; Ranch 1050 and 187 in Uvalde County; Ranch 674 in Edwards County.

San Antonio District: All farm roads in Medina, Bandera and Kerr counties; State 16 Kerrville to Bandera; State 173 Hondo to Devine.

San Angelo District: State 29 west of Menard; Ranch 189 in Sutton County; Ranch 864 in Sutton County; Farm 765 east of Eola; Farm 1311 at San Saba River; U.S. 277 south of Sonora; U.S. 377, 13 miles south of Junction; Ranch 385 London to Harper.



## Some Highways Are Still Closed

Highways closed in the Tyler Highway District, as reported by the State Highway Dept., included FM 85 west of Mabank; FM 47 north of Canton; FM 17 from Grand Saline to Alba. Some water is still over State 294 west of Alto but the highway is open.

ized that on a recent map, notations for 196 U. S. and state highways and 38 farm to market roads were required. Mailing date of the Bulletin must be prior to the first of the month, and it is in the time interval between the twenty-fifth and the first day of the new month that the Bulletin must be compiled, printed, and distributed.

Users of the Road Condition Bulletin are on the increase. In four years the mailing list for the free service has jumped from 825 to 1,600. Tourists, commercial firms, travel organizations, and Department personnel make up the mailing list. The Bulletin is used for routing items which can risk no delay along the road. Within the Department, Maintenance Operations Division consults the Road Condition Bulletin before issuing a permit for certain truckloads to travel certain highways. All District Engineers' offices, Division offices, and the Travel Bureaus along the state's borders have this monthly publication at their fingertips. The Department of Public Safety and the State Division of Defense and Disaster Relief, of course, are recipients. Oil company tourist services, transportation firms, offices of the American Automobile Association and other automobile clubs throughout the nation use the monthly publication. The rest of the mailing list, as Morgan puts it, "are people going somewhere themselves or expecting someone to arrive."

# PLANT-MIXING CEMENT

**Fred C. Stanley, District Construction Engineer**
**District 5**

A cement-stabilized flexible base was constructed recently on a project in Swisher County on U. S. 87 from Tulia south to the Hale County Line. A traveling mixer was specified for this contract, but the contractor requested that he be permitted to use a continuous-mix plant instead of the road mixer. Since a more uniform mix could be obtained in a pugmill than by road-mixing methods, a field change was requested and approved to permit the use of plant-mixing methods.

The plant was set up at the caliche pit near the crusher. After the caliche was crushed it was taken from the bin by dump truck to a hopper, and from there by conveyor into the pugmill where the caliche, water, and cement were mixed. The mixture was discharged into dump trucks, hauled to the road, dumped into spreaders, and then distributed uniformly, ready for rolling.

The plant setup included three 260-barrel cement silos for storage and feeding cement into the pugmill. The cement was discharged on the caliche conveyor just before it emptied the mixture into the pugmill. The silos were connected in tandem by screw conveyors. These augers were driven by 10-hp, 1750-rpm, 220/440-v 60-cycle motors. Compressed air kept the cement loosened and prevented pack-

*This over-all view of operations shows the bulk cement truck, cement silos, mixing plant with dump truck to receive mixture, and caliche conveyor with caliche truck above grizzly.*

ing. The plant-feed auger was driven by a 3-hp, 60-cycle, 220/440-v, 1750-rpm motor which would deliver 840 pounds in 80 seconds at 1275-1300 rpm. The caliche flow was controlled by a weir to deliver about six cubic yards in 80 seconds. The control of the cement content could not be exact, of course, but it was close enough that the final cement content was 6.17 per cent instead of 6 per cent as proposed on the plans. Periodic checks were made on the percentage of cement used so that corrections could be made in the speed of the auger. The cement tended to pack, causing some difficulty. Its adherence to the auger required that it be cleaned at intervals. Water was delivered to the

*The base spreader receives a load of mixture.*

*Tamping roller follows the spreaders.*

# WITH FLEXIBLE BASE

*No turning at ends of lands is necessary with this self-propelled pneumatic roller.*

*Shaping and finishing is done with blade grader.*

***Compaction operations are underway with this steel wheel and pneumatic roller.***

plant by pipeline from an irrigation well. The cement was delivered in bulk by trucks.

Spreaders were attached to dozer blades and pushed by crawler-type tractors. Two spreaders were used, each spreading one-half the roadway width, with one working slightly in advance of the other. The total width of treated material was 26 feet. Shoulders were of untreated caliche with a single-asphalt surface treatment.

After material was spread, rolling was begun with a heavy tamping roller attached to the front of a tractor. This equipment did not require turning at the ends of each land. This was followed by a 25-ton, self-propelled pneumatic roller, and again no turning was required at the ends of lands. After rolling, shaping was begun with a blade grader and compaction was continued with the pneumatic roller and a flat-wheel roller until the land was finished. A base preservative of RC-2 asphalt with Grade 5 aggregate was applied immediately after finishing. Some water had to be added during finishing operations to replace that lost by evaporation. A seal coat was applied before opening to traffic.

The subgrade on this project had a triaxial classification of approximately 4.4, requiring fifteen and one-half to sixteen inches of better material for a 12,000-pound wheel load. Ten inches of raw caliche were placed first, followed by six inches of cement-stabilized caliche to provide the required total of sixteen inches.

***RC-2 base preservative is applied.***

The caliche used was a material with an average P.I. of 9, a shrinkage of 4, and a soil binder content of 42 per cent. The triaxial classification without cement was 3. Punch-shear tests run on this material with 6 per cent cement as mixed on the job averaged 2,547 pounds, with two thousand pounds considered adequate. Compression tests averaged 730 p.s.i. with 650 p.s.i. considered adequate.

Cost of soil cement for this project was approximately 67 cents per square yard. The contractor bid 27 cents per square yard for mixing and the cement at $4.60 per barrel.

***Completed base preservative.***

# OVER THE HIGHWAYS

## Comments . . . from the Traveling Public

**On Tourist Bureaus—**

• We like the fine Texas roads and the information bureau near Denison where we were well directed and even got information about Houston and San Antonio. I wish you had one near every large city.

Oklahoma City, Oklahoma

• Your help at the Laredo office were out of this world—none better anywhere.

L. C. Yates
Dewey, Oklahoma

• Your attendant near Denison (Tourist Bureau) is one of the most courteous and helpful it has been my good fortune to contact. He deserves *top* pay.

K. W. Evans
Springfield, Missouri

**On Roads and Marking—**

• We like your good roads and good markings of your roads. Very pleasant. Vista, California

• Historical information and markers could be more available.

Santa Monica, California

• We liked the highways in Texas. They were so clean and inviting. We only wish we could travel them more often.

Shreveport, Louisiana

**On Speed—**

• We disliked the stupid slow speed limits, especially on *very good roads.*

Dr. E. W. Sparks
Hannibal, Missouri

• We cannot understand why they have speed limits on the highway when no one obeys them.

W. M. Hall
Kansas City, Missouri

**On Employees—**

• I had occasion to come in contact with two of your employees during the floods of the past week end. They were so courteous, efficient, and cooperative that I wanted to express my appreciation to the Department.

I am sorry I do not know their names. We were at Hunt, across the north fork of the Guadalupe River, and your men were in a truck in that area. I hope this is sufficient information for you to be able to identify them as I should appreciate your conveying to them my gratitude. It is reassuring to know that the Highway Department has on its staff such competent employees.

Frances Ward
Austin, Texas

• My wife and I would like to express sincere thanks and appreciation of an act of courtesy and helpfulness on the part of one of the men in your (Brownwood) district.

At about 9:30 on the morning of Monday, 31 August, about three miles north of Lometa on highway 183 our automobile suddenly developed severe cooling trouble. Your man, after helping us get back to Lometa, took off before I had a chance to thank him, find out his name, or even note the license number of his pick-up. After some inquiries I found out that the man was probably an engineer working out of either Goldthwaite or Lampasas. I hope you can determine his identity and convey to him our thanks.

If such is the attitude of the men in the Texas State Highway Department organization, and your district in particular, I can only say that the lot of the motoring public in this state is in excellent hands, and that some recognition of that small army of men who design, construct, and maintain our highways ought to be brought to the attention of all.

Charles G. Decker
Professor of Civil Engineering
Texas Technological College
Lubbock, Texas

◆ *Such an attitude on the part of Highway Department men has been praised and complimented countlessly over the years. Limited to no one locale, letters flow in relating such experiences throughout the state. This cooperativeness is something we are all proud of, and these men are top-notch public relations men for the Department.*

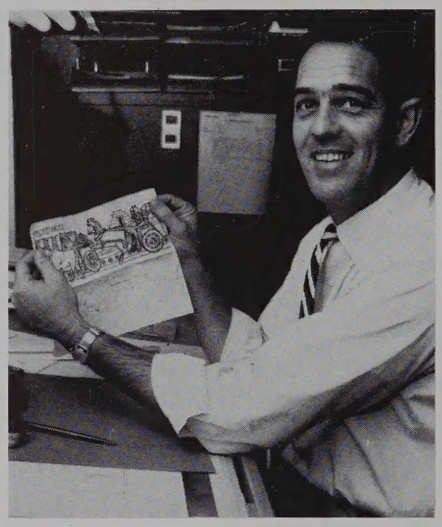
# To and From Our Readers

• A Conference on Planning City Traffic Improvements will be held at A & M College November 18-19. This conference, sponsored by the Texas Transportation Institute and Department of Civil Engineering is held in cooperation with Texas Section—Institute of Traffic Engineers, Texas Municipal League, Texas Highway Department, and Automotive Safety Foundation. Dealing with the problems of cities from 10,000 to 100,000 population, the conference is for city managers, mayors, highway engineers, traffic engineers, city engineers, city planners, and county engineers.

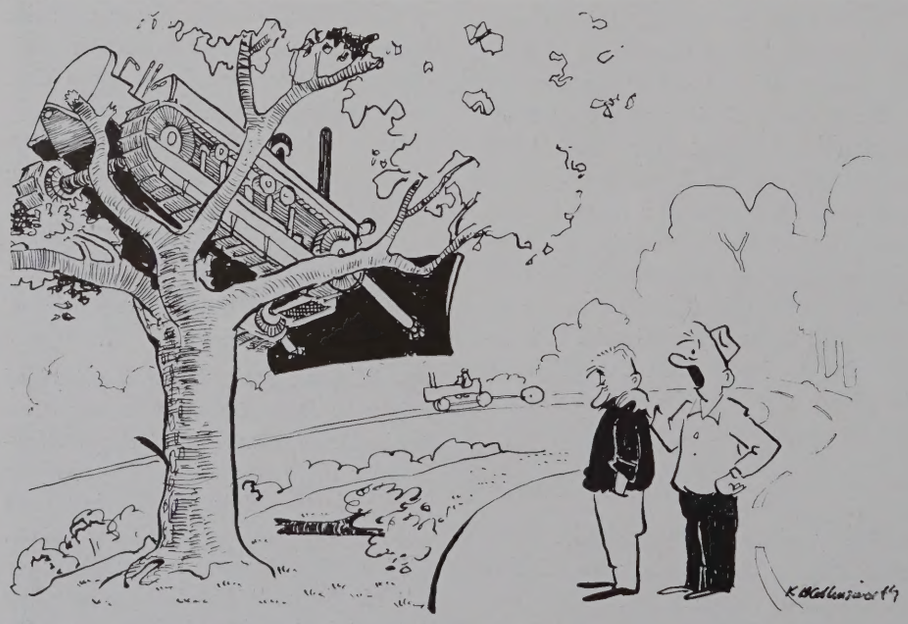
• The low blow of the month came from a Louisiana tourist who wrote of his dislike for the climate—too hot; the people—they didn't speak English; and the land—too barren. He finished up by saying that what he liked about his visit to Texas was "leaving the second-largest state in the Union."

This gentleman evidently expected reaction because he also noted an address that we should please send replies to. Any takers?

• Photographer Doug Fairchild thought artist Bob McCarty's choice of art material was a little strange, so he snapped a picture. Around the office we don't pay much attention to what McCarty draws *on*, just how it comes out. His imaginative art and layout have been gracing the pages



of TEXAS HIGHWAYS for seven years. How this drawing on Kleenex tissue came out can be seen on page 9 of this issue.



"FORGET IT FEZBY, YOU WOULDN'T BE ONE OF US IF YOU DIDN'T MAKE A LITTLE MISTAKE ONCE IN A WHILE."

**ABOUT OUR PICTURES . . .**

A study in lines, the front cover pictures U.S. 87 between Canyon and Amarillo. Harvested sorghum borders one side of the wide, divided highway.

Inside the front cover is pictured the Loop 293, or Bergstrom, Interchange under construction near Austin. Three highways merge here—State Highway 71, U. S. 183, and the South Belt Loop.

The sometimes not-so-sleepy Rio Grande flows out of Santa Elena Canyon in Big Bend National Park in the picture inside the back cover. Made from the Texas side, the picture looks into Mexico.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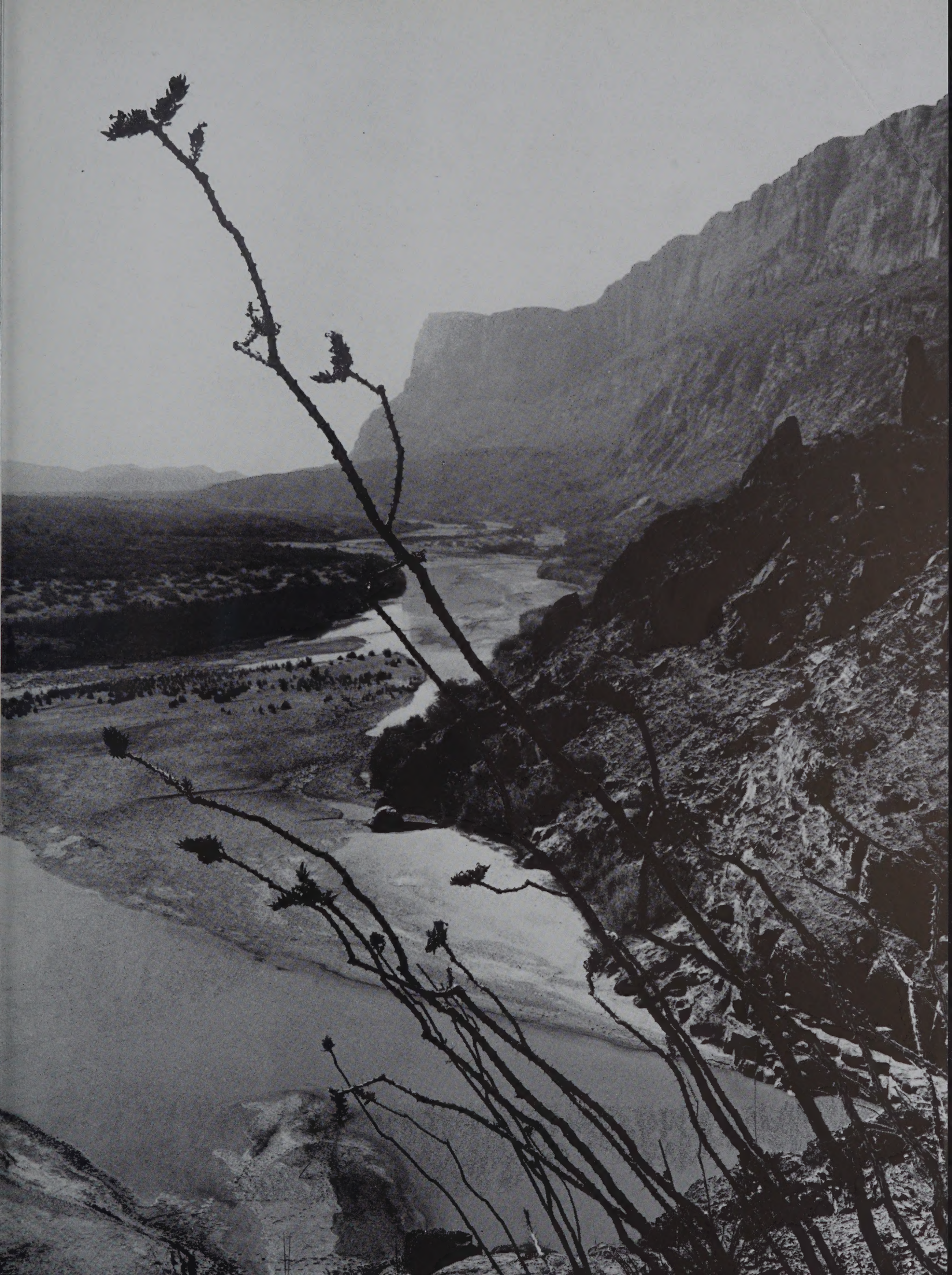
## Texas Highways

TEXAS HIGHWAYS, official journal of the Texas Highway Department, is published in the interest of highway development in Texas and for departmental education in the improvement of construction, maintenance, and operation.

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